

**WE CLAIM**

1. A method of identifying a failure location in a datapath in a communication element, said datapath traversing from an ingress point through at least a first component to an egress point, said method comprising:

5 Providing a diagnostic cell to adapted to be inserted at a startpoint upstream of said first component in said datapath;

Providing at least a first diagnostic cell counter module adapted to be associated with a first location in said first component, said first diagnostic cell counter module being adapted to recognize when said diagnostic cell passes said first location and being adapted to track passage of said diagnostic cell past said first location;

Inserting said diagnostic cell into said datapath at said starting point; and

Analyzing said diagnostic cell counter module to identify said failure location in said datapath.

15 2. A method of identifying a failure location in a datapath as claimed in claim 1 wherein said diagnostic cell counter module tracks passage of said diagnostic cell past said location using a counter.

20 3. A method of identifying a failure location in a datapath as claimed in claim 2 wherein said failure location is identified as being downstream of said first location when said diagnostic cell counter module recognized that said diagnostic cell passed said first location.

4. A method of identifying a failure location in a datapath as claimed in claim 3 wherein a second diagnostic cell counter module is provided at a second location in said datapath, said second diagnostic cell counter module being adapted to recognize when said diagnostic cell passes said second location and being adapted to track passage of said diagnostic cell past said second location.

5. A method of identifying a failure location in a datapath as claimed in claim 4 wherein said failure location is identified as being downstream of said second location when said second diagnostic cell counter recognized that said diagnostic cell passed said second location.

6. A method of identifying a failure location in a datapath as claimed in claim 5 wherein said datapath traverses an ingress line card, a switching fabric and an egress line card; said starting point is upstream of said ingress line card; and said first component is selected from one of said ingress line card and said egress line card.

7. A method of identifying a failure location in a datapath as claimed in claim 6 wherein said datapath is defined by a VPI/VCI connection.

8. A method of identifying a failure location in a datapath as claimed in claim 5 wherein said datapath traverses an ingress line card and returns through said ingress line card.

9. A method of identifying a failure location in a datapath as claimed in claim 8 wherein said datapath is defined by a VPI/VCI connection.

10. A system for identifying a failure location in a datapath in a communication element, said  
5 datapath traversing from an ingress point through at least a first component to an egress point, said system comprising:

at least a first diagnostic cell counter module adapted to be associated with a first location  
in said first component, said first diagnostic cell counter module adapted to recognize  
10 when a diagnostic cell passes said first location and adapted to track passage of said  
diagnostic cell past said first location; and  
an analysis module adapted to analyze said diagnostic cell counter module to identify  
said failure location in said datapath.

15 11. A system for identifying a failure location in a datapath as claimed in claim 10 wherein said diagnostic cell counter module tracks passage of said diagnostic cell past said first location using a counter.

12. A system of identifying a failure location in a datapath as claimed in claim 11 wherein  
20 said analysis module identifies said failure location as being downstream of said first location when said diagnostic cell counter module recognized that said diagnostic cell passed said first location.

13. A system method of identifying a failure location in a datapath as claimed in claim 12 wherein a second diagnostic cell counter module is provided at a second location in said datapath, said second diagnostic cell counter module being adapted to recognize when said diagnostic cell passes said second location and being adapted to track passage of said diagnostic cell past said second location.

14. A system of identifying a failure location in a datapath as claimed in claim 13 wherein said analysis module is adapted to identify said failure location as being downstream of said second location when said second diagnostic cell counter recognized that said diagnostic cell passed said second location.

15. A system of identifying a failure location in a datapath as claimed in claim 6 wherein said datapath is defined by a VPI/VCI connection.